



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

of determining the longitude of any other point in that circle, from its latitude.

The third paper was entitled, "Hygrometrical Observations made on board His Majesty's surveying vessel *Ætna*." Communicated by Captain Beaufort, R.N., F.R.S.

These observations extend from the 27th of March to the 6th of July, 1834, and were made daily at 8 o'clock A.M., at noon, and at 4 o'clock P.M. They comprise the height of the barometer, the dew-point, degrees of dryness on the thermometrical, and of moisture on the hygrometrical scales, the elasticity of the vapour, and the number of grains of vapour in a cubic foot; with occasional remarks. A second series is also given, exhibiting the progress of solar radiation.

The fourth was a "Meteorological Register, from the 1st of January to the 1st of November, 1834," by Mr. Edward Barnett. Communicated by Capt. Beaufort, R.N., F.R.S.

These observations, made during a voyage across the Atlantic, relate chiefly to the temperatures of the air, and of the surface of the sea.

The fifth was a "Meteorological Register, kept on board His Majesty's Ship *Thunder*, between the 1st of January and the 30th of June, 1834," by R. Owen, Commander. Communicated by Captain Beaufort, R.N., F.R.S.

These observations relate to the state of the weather, the direction and force of the wind, and the heights of the thermometer, and of the marine and oil barometers.

May 14, 1835.

JOHN WILLIAM LUBBOCK, Esq., Vice-President and Treasurer, in the Chair.

A paper was read, entitled, "An Account of the Water of the Well *Zem-zem*, with a qualitative analysis of the same by Professor Faraday"; in a letter from John Davidson, Esq., to the Secretaries, and communicated by them.

The author having, during his stay at Jedda, the port of Mecca, succeeded in procuring about three quarts of the water from the well of *Zem-zem*, to which the Mahomedans ascribe a sacred character and extraordinary virtues; and wishing to preserve this water for the purposes of analysis, had the can in which it was contained carefully sealed; but, unfortunately, on its arrival in the London Docks, the can, notwithstanding the directions written on it, was opened, and the gas with which it was highly charged, and by which it held in solution a very large quantity of iron and other matters, was allowed to escape. The precipitate thrown down, in consequence of the loss of this gas, was found, by Professor Faraday, to consist of carbonate of protoxide of iron in the enormous proportion of 100·8 grains to the imperial pint of water. The clear fluid was neutral, and contained much muriate, and a little sulphate, but no carbonate; together with a little lime, potash, and soda. There was also found an alkaline ni-

trate in considerable quantity ; this Mr. Faraday conjectures to have been saltpetre, which had been added to the water by the priests.

The reading of a paper was commenced, entitled, " Observations on the Theory of Respiration." By William Stevens, M.D., D.C.L., Fellow of the Royal College of Physicians of Copenhagen, and of Surgeons of London. Communicated by W. T. Brande, Esq., V.P.R.S.

May 21, 1835.

WILLIAM THOMAS BRANDE, Esq., Vice-President, in the Chair.

The reading of the paper, entitled, " Observations on the Theory of Respiration." By William Stevens, M.D. D.C.L., Fellow of the Royal College of Physicians of Copenhagen, and of Surgeons of London. Communicated by W. T. Brande, Esq., V.P.R.S., was resumed and concluded.

From the fact that no carbonic acid gas is given out by venous blood when that fluid is subjected to the action of the air-pump, former experimentalists had inferred that this blood contains no carbonic acid. The author of the present paper contends that this is an erroneous inference ; first, by showing that serum, which had been made to absorb a considerable quantity of this gas, does not yield it upon the removal of the atmospheric pressure ; and next, by adducing several experiments in proof of the strong attraction exerted on carbonic acid both by hydrogen and by oxygen gases, which were found to absorb it readily through the medium of moistened membrane. By means of a peculiar apparatus, consisting of a double-necked bottle, to which a set of bent tubes were adapted, he ascertained that venous blood, agitated with pure hydrogen gas, and allowed to remain for an hour in contact with it, imparts to that gas a considerable quantity of carbonic acid. The same result had, indeed, been obtained, in a former experiment, by the simple application of heat to venous blood confined under hydrogen gas ; but on account of the possible chemical agency of heat, the inference drawn from that experiment is less conclusive than from experiments in which the air-pump alone is employed. The author found that, in like manner, atmospheric air, by remaining, for a sufficient time, in contact with venous blood, on the application of the air-pump, acquires carbonic acid. The hypothesis that the carbon of the blood attracts the oxygen of the air into the fluid, and there combines with it, and that the carbonic acid thus formed is afterwards exhaled, appears to be inconsistent with the fact that all acids, and carbonic acid more especially, impart to the blood a black colour ; whereas the immediate effect of exposing venous blood to atmospheric air, or to oxygen gas, is a change of colour from a dark to a bright scarlet, implying its conversion from the venous to the arterial character : hence the author infers that the acid is not formed during the experiment in question, but already exists in the venous blood, and is extracted from it by the atmospheric air. Similar experiments made